

# Patent Public Advisory Committee Quarterly Meeting

## Patenting and Licensing *from the University Perspective*

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UNITED STATES  
PATENT AND TRADEMARK OFFICE



- A Primer on the University Patenting and Licensing Practice
- A View of Universities in the Innovation Ecosystem
- Conclusions

- What are the goals and tools of a university patenting and licensing practice?
- What are the features of a university patenting and licensing practice?
- How do these goals and features translate to university expectations from the patent system?

## The Goals

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- transfer university research
  - outside the university
  - for the benefit of society on a local, national, and global basis



- support university research, education, and teaching

- protect university inventions with patents
  - university owns the inventions of its faculty
- license university patent rights
  - to start-ups and commercial enterprises
  - for development into practical applications
  - at market-rate terms
  - to generate revenue

## The Key Features



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- Early-stage research
  - filing at the start of the inventive process
  - filing before a product or market exists
- Diversified
  - filing across a broad range of technologies
- Unpredictable research success
  - maintaining a large patent portfolio for years

## The University Expectations

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- Quality Examination 
  - Early filing and unpredictable research success requires us to seek broad claims.
  - Quality examination ensures that these claims will withstand validity challenges downstream.
- Compact Prosecution 
  - Diversification and unpredictable research success requires us to file extensively.
  - Compact prosecution helps us to focus our resources on the most patentable inventions.

## The Innovation Ecosystem

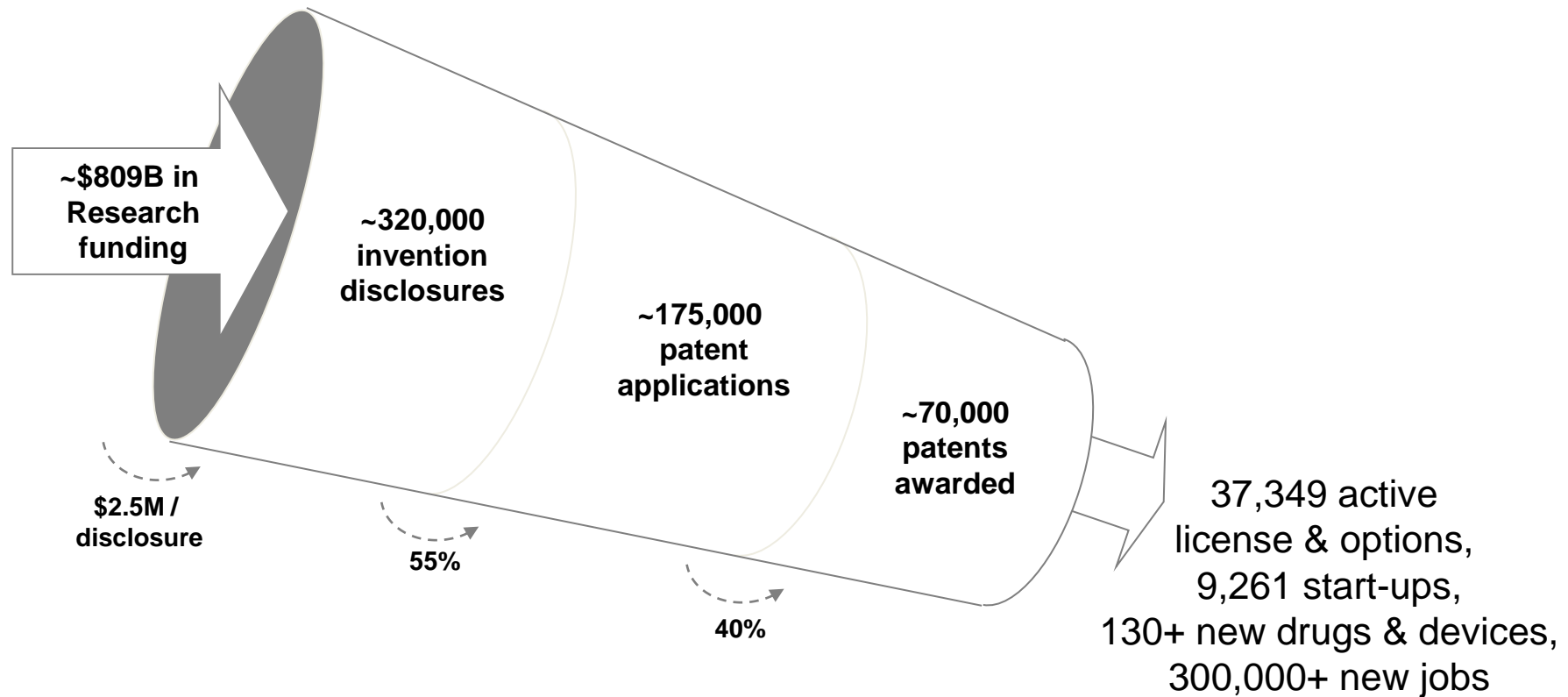
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- What roles do universities play in the innovation ecosystem?
- What challenges do universities face in being successful in these roles?
- What is Columbia's experience?



# Universities are Initiators of Innovation.

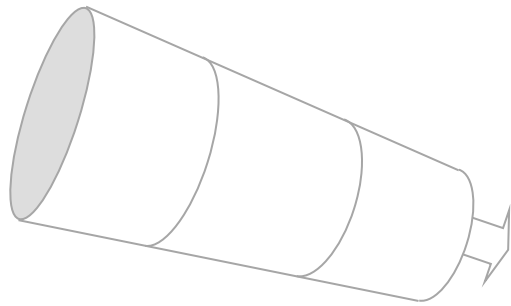
*Cumulative* Inputs and Outputs, 1991 – 2014, US Universities



# Universities are Suppliers of Innovation.

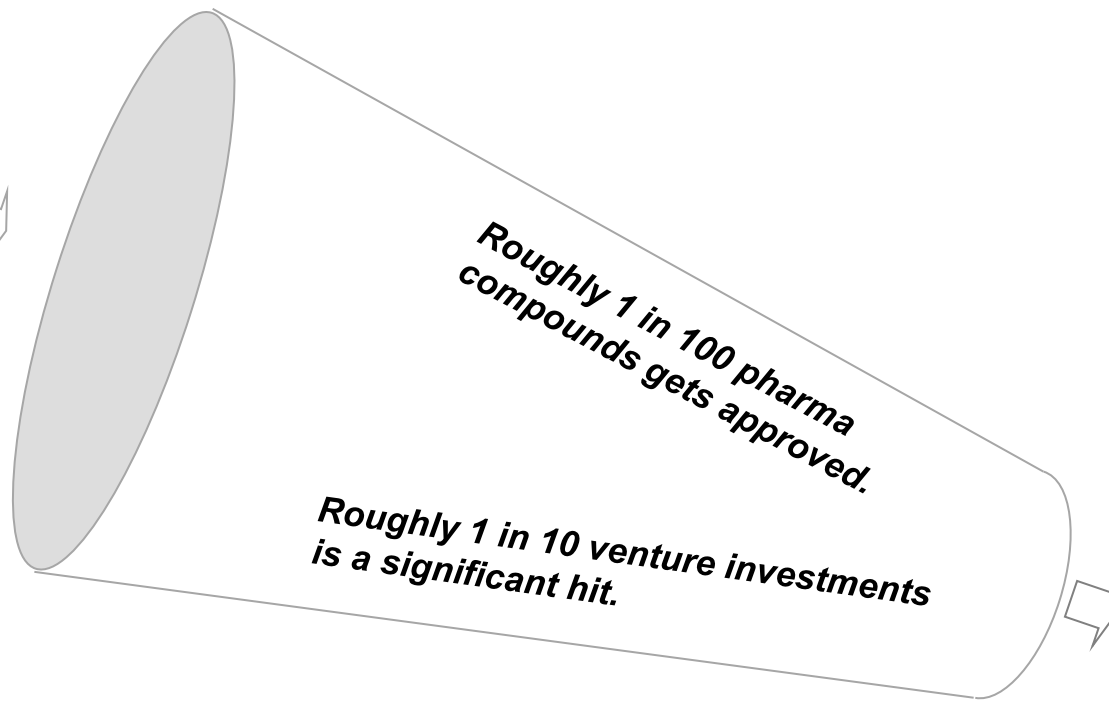
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University's Funnel



*Only 1 in 6 inventions  
ever gets licensed.*

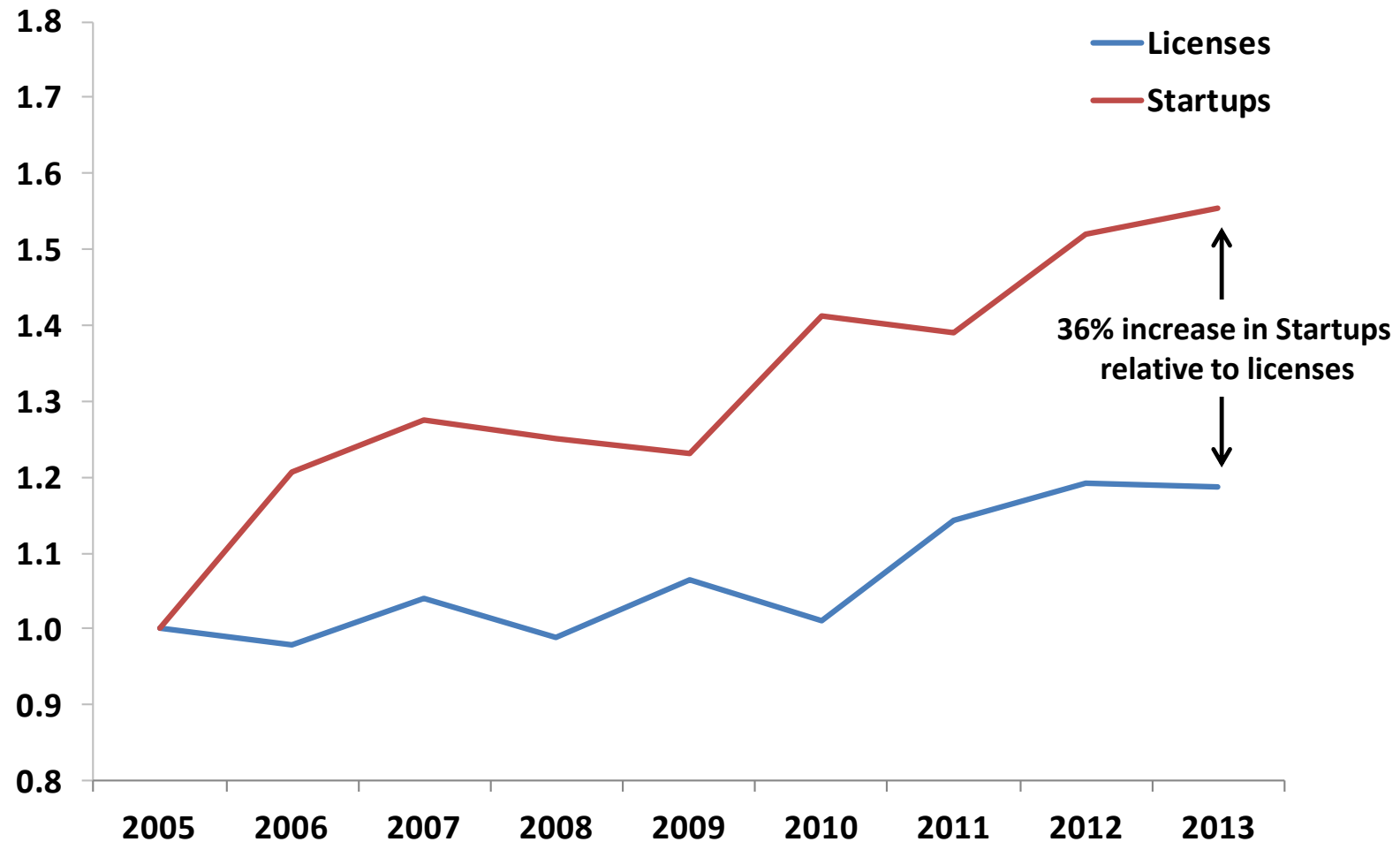
Industry / VC's Funnel



**Success!  
a product  
on the  
market**

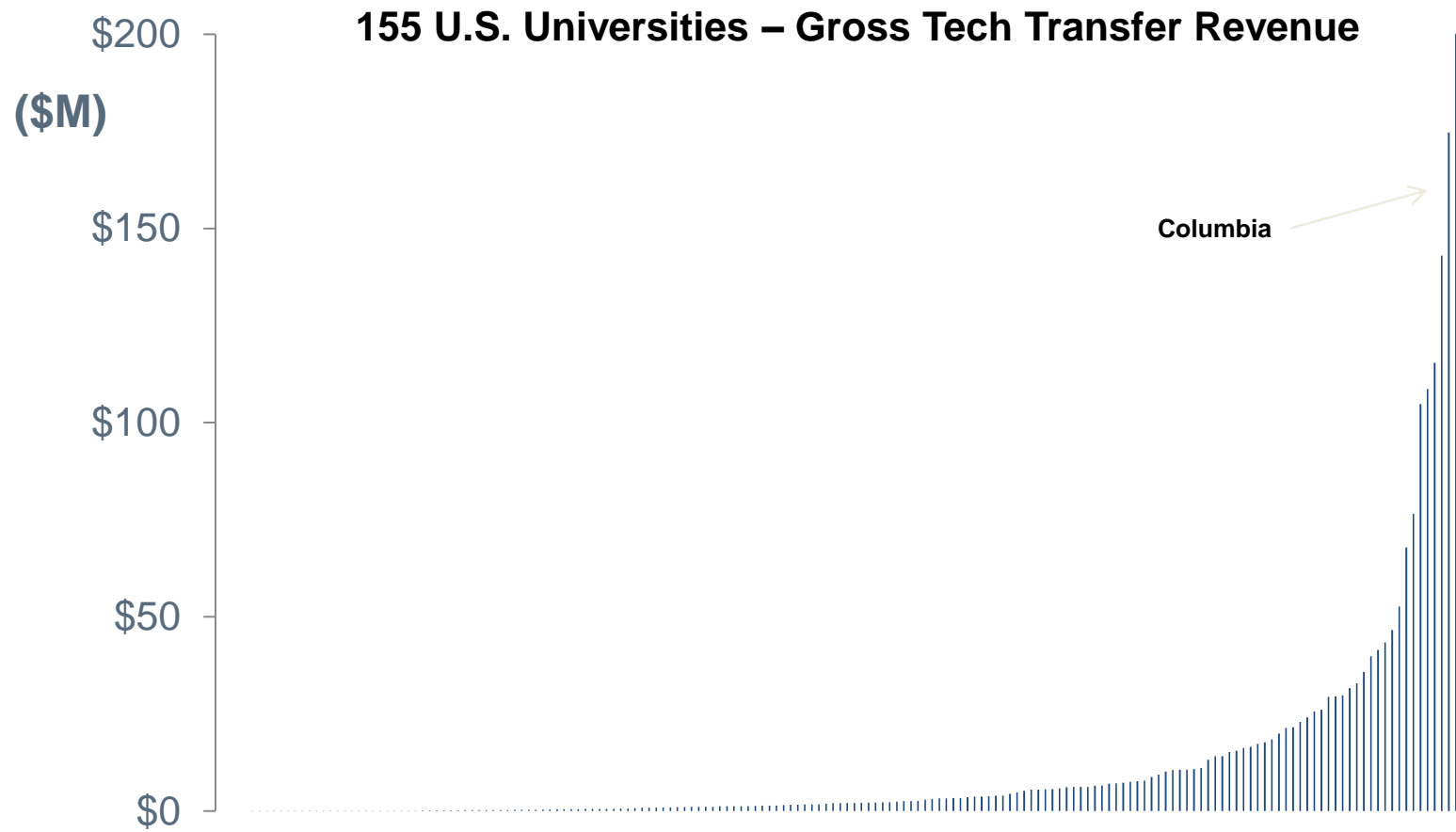
# Universities are champions of Startups.

AUTM Data for All US Universities (1.0 = FY2005)



# Universities Face Many Challenges in these Roles.

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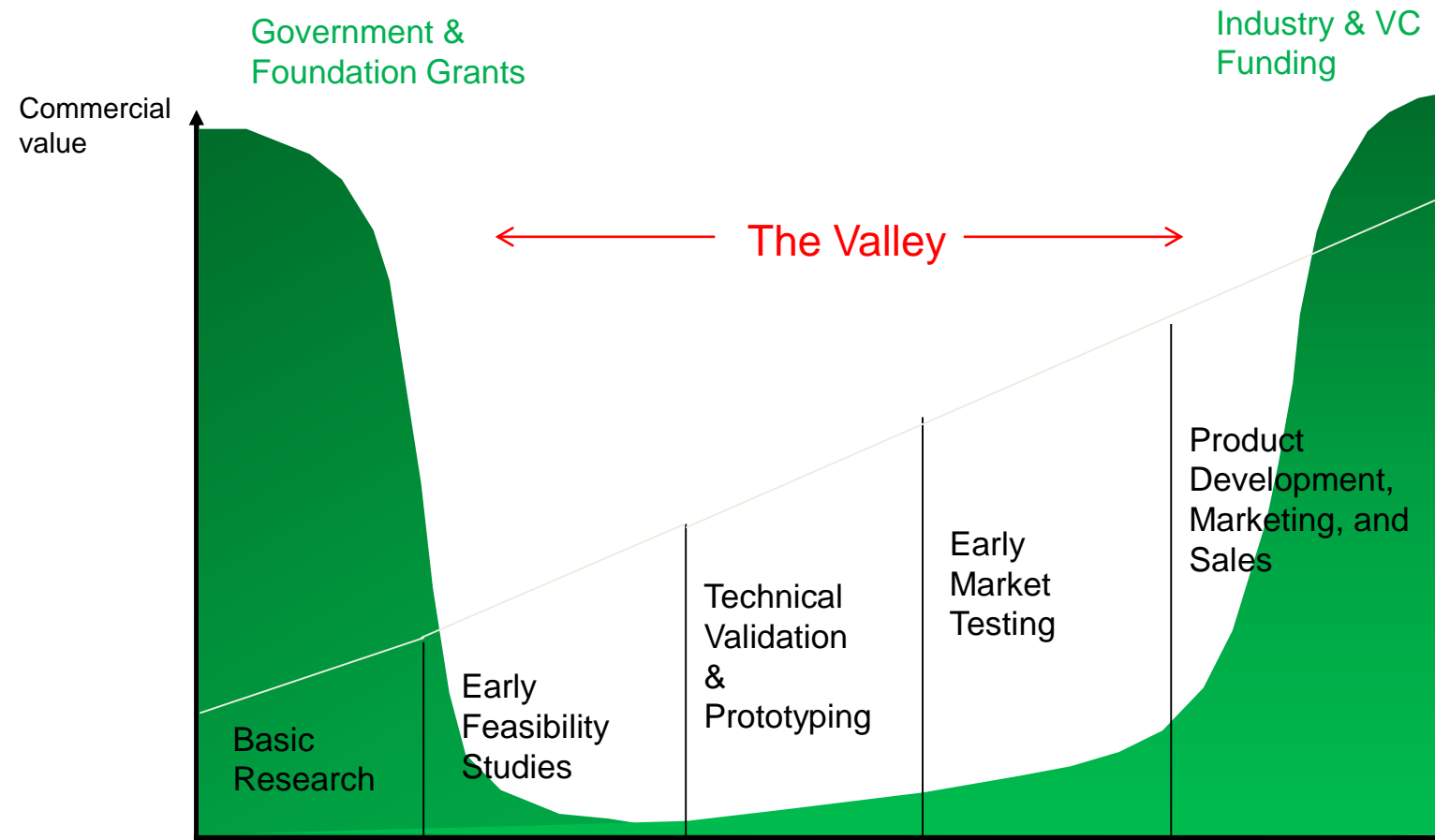
# ***Why is this so hard?***

Unpredictable Research Success

Part 1: The Valley of Death

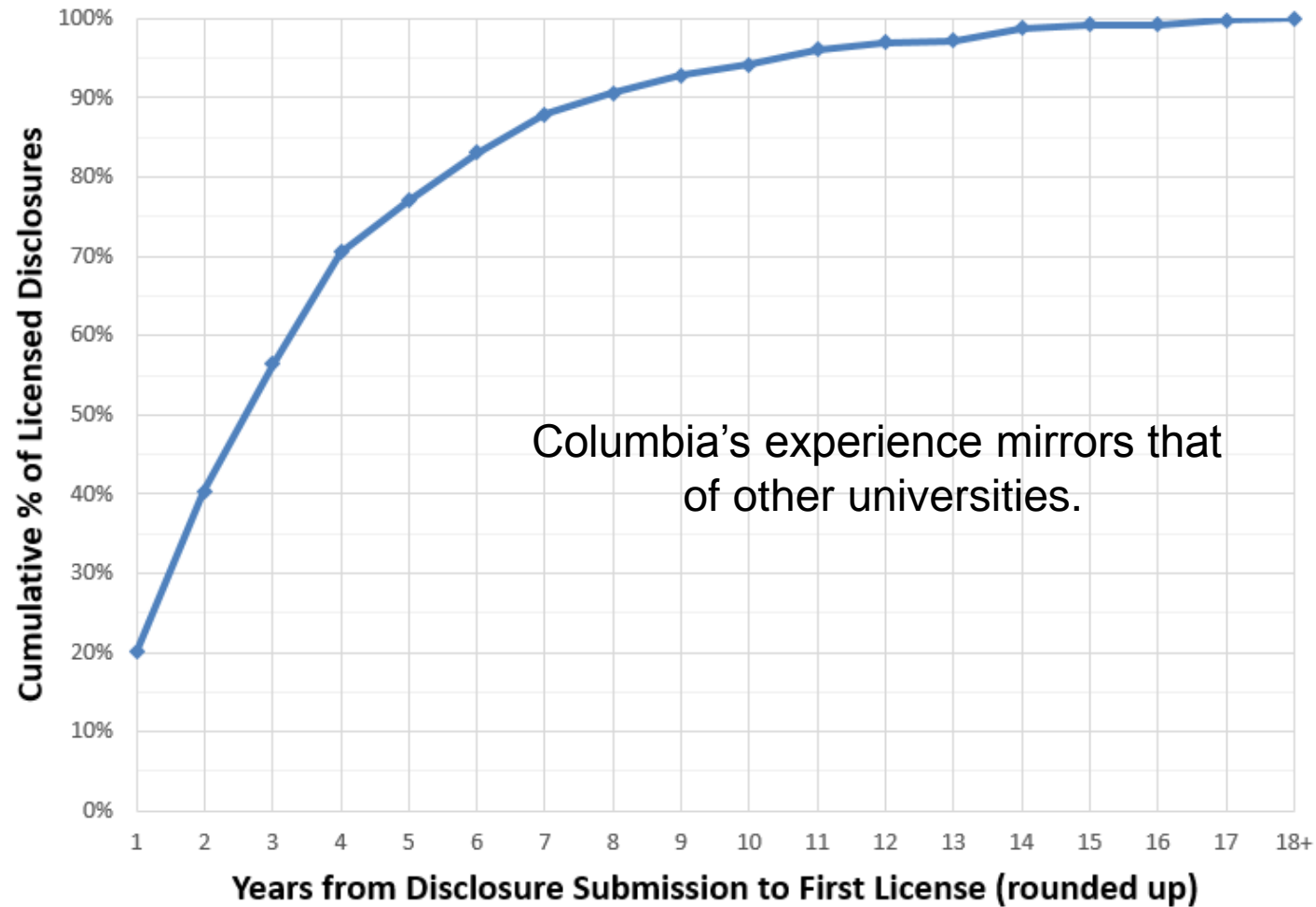
Part 2: Predicting the Commercial Future is Hard.

# The Valley of Death



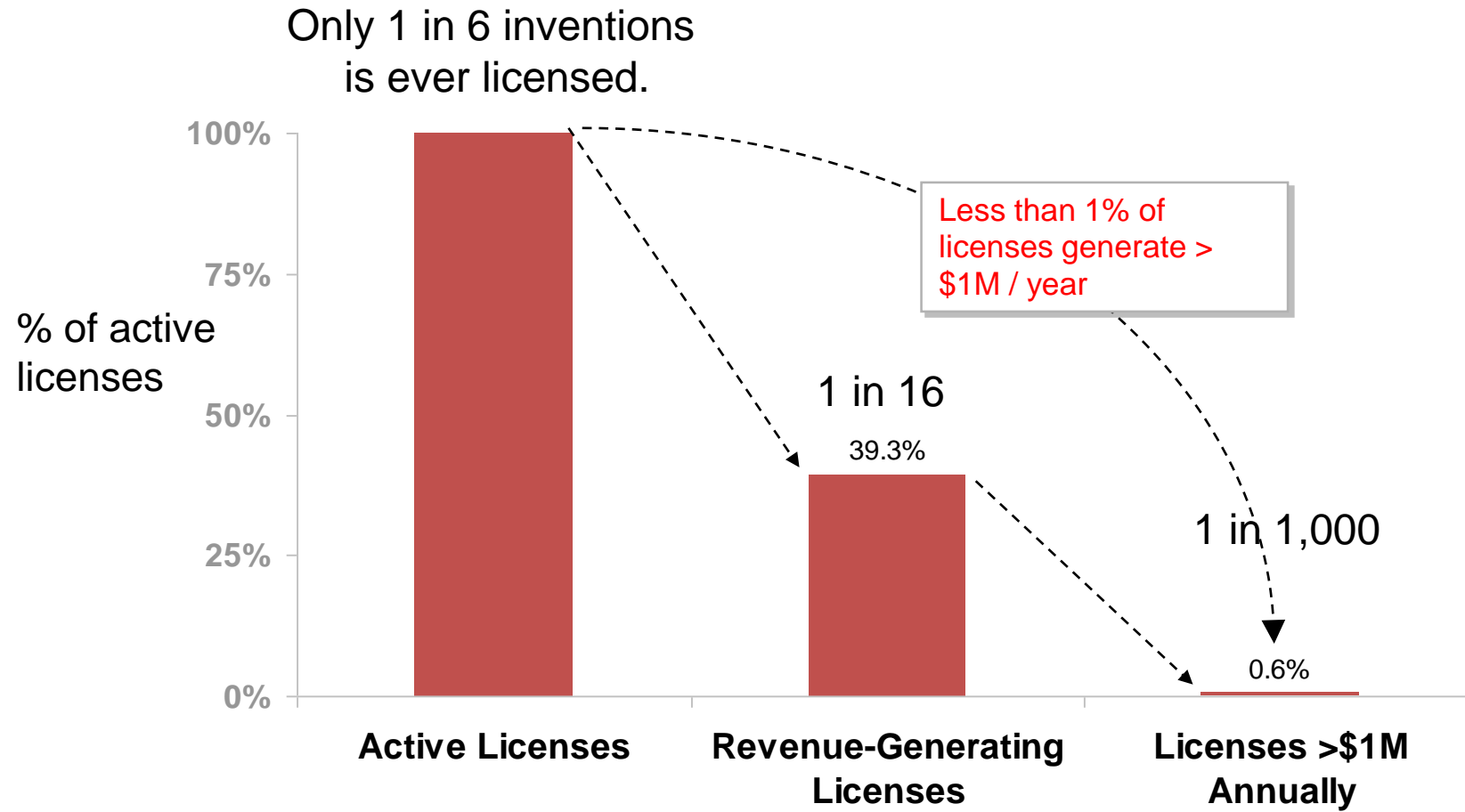
# Predicting the Commercial Future is Hard.

For Columbia, only ~55% of Deals Done by Year 3, only 85% by Year 6



# Blockbusters Drive Most of the Revenue.

But are Rare.

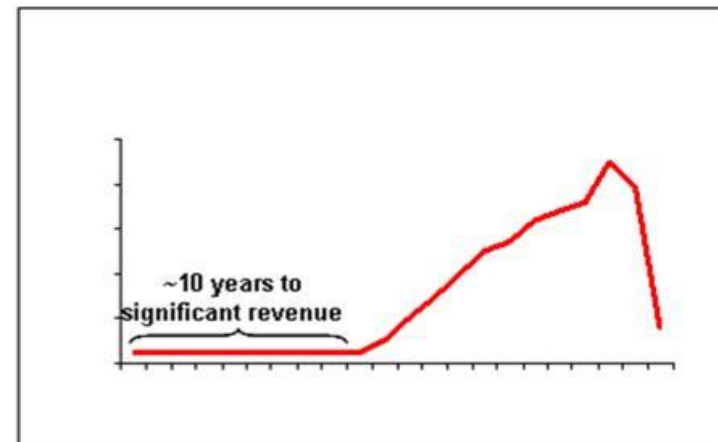
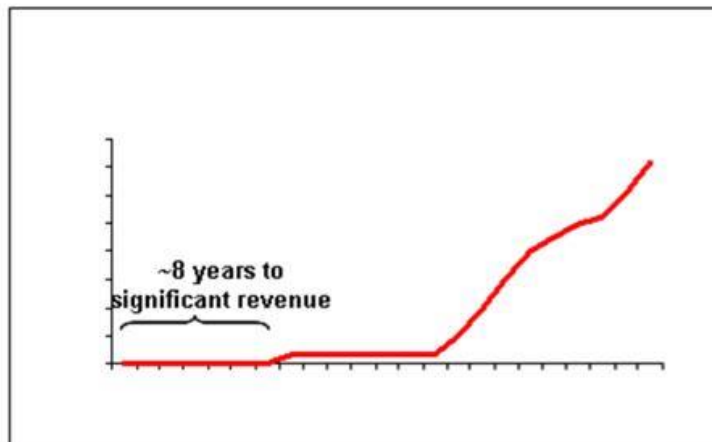
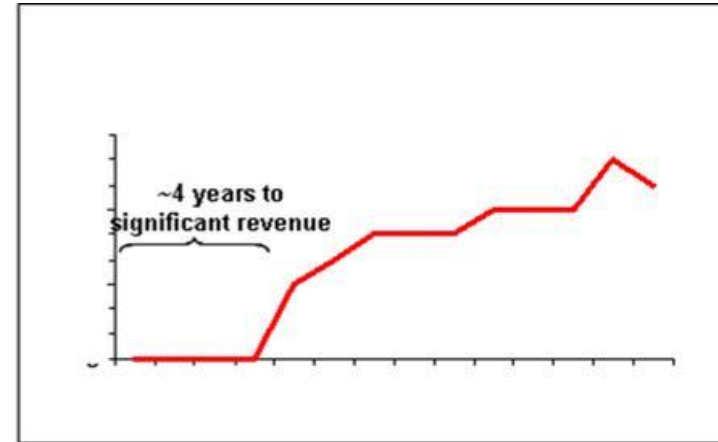
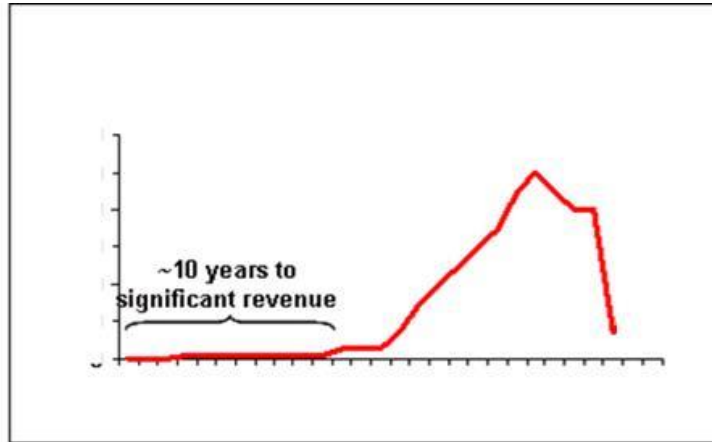




# And Blockbusters Take Many Years To Develop.

And They Aren't Always Obvious at the Time.

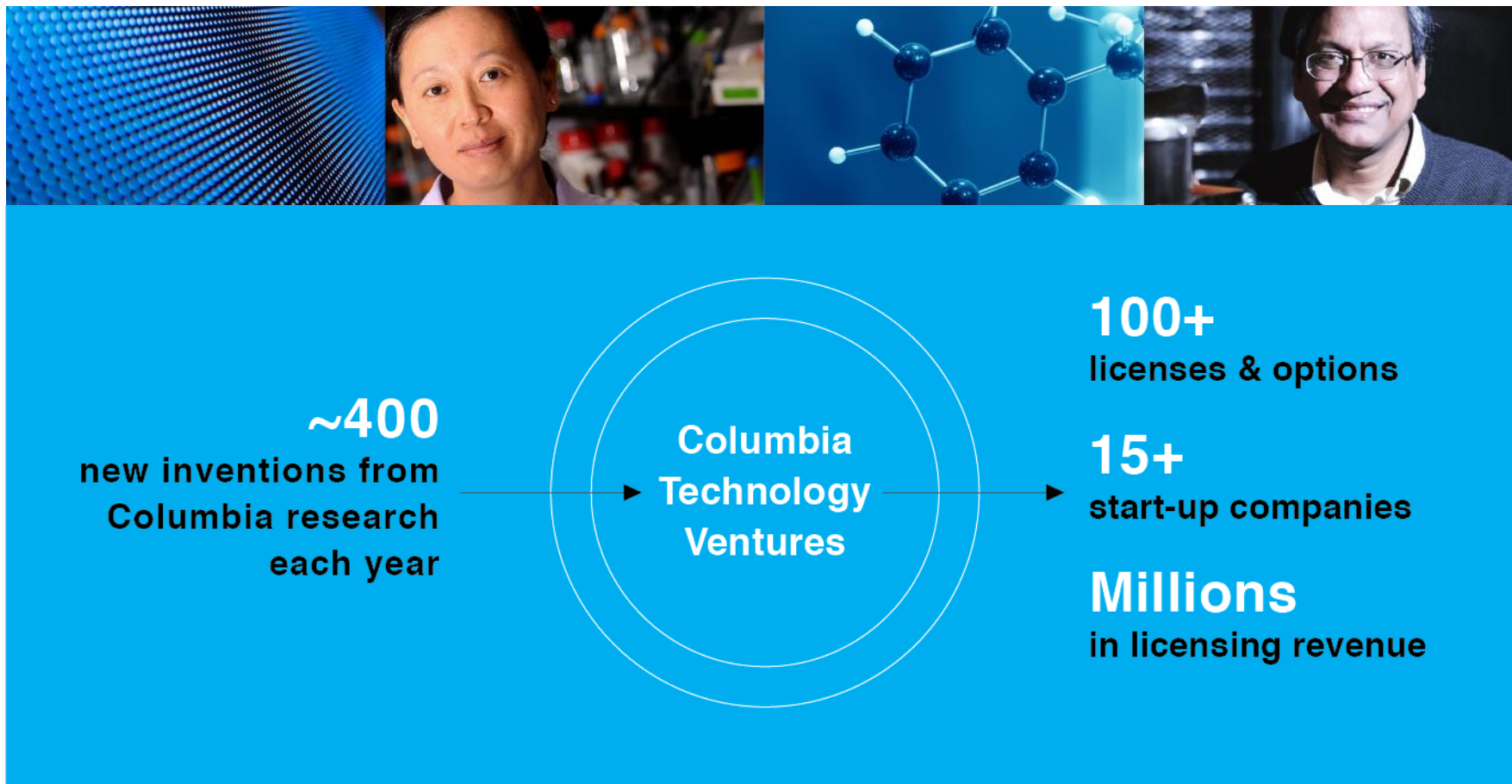
Columbia's Four Biggest Revenue Producers  
**(Revenue per Year)**



# Columbia's Experience

On an Annual Basis.

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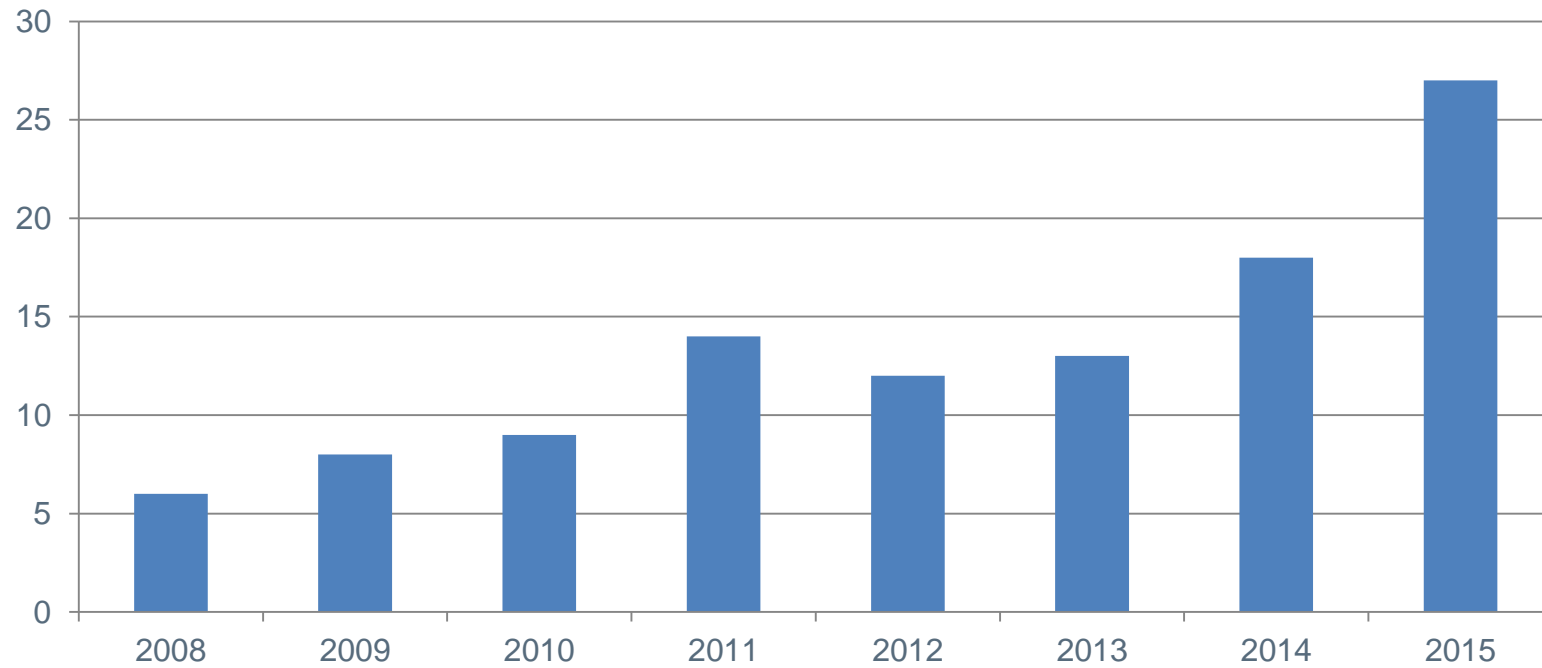


# Products Using Columbia Technology



## >50% of Our Exclusive Licenses Are Now Granted to Startups On An Annual Basis.

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**An Explosion of Startups!**

# 150+ Startups Spun out of Columbia in 20 Years

100+ still active, 45+ VC-backed, 10 gone public, 23 acquired

## Health Analytics



**Intelligent Bio-Systems**  
A QIAGEN company



## Pharma & Devices



## Media & Fashion



## Communications & Devices

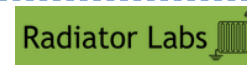


## Cybersecurity & Corporate Computing

System Management ARTS (SMARTS)



## Cleantech



## Conclusions (Part 1)

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- Universities are initiators in the innovation ecosystem.
- As initiators, universities follow a virtuous cycle that leverages early-stage innovations and patents to support research, education, and teaching for society's benefit.

## Conclusions (Part 2)

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- Participation in the innovation ecosystem requires investment and patience.
- USPTO quality examination and compact prosecution help universities focus their investment.
  - *The USPTO thereby provides critical support for the virtuous cycle underlying the start of the innovation ecosystem.*

# Questions and Comments

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uspto



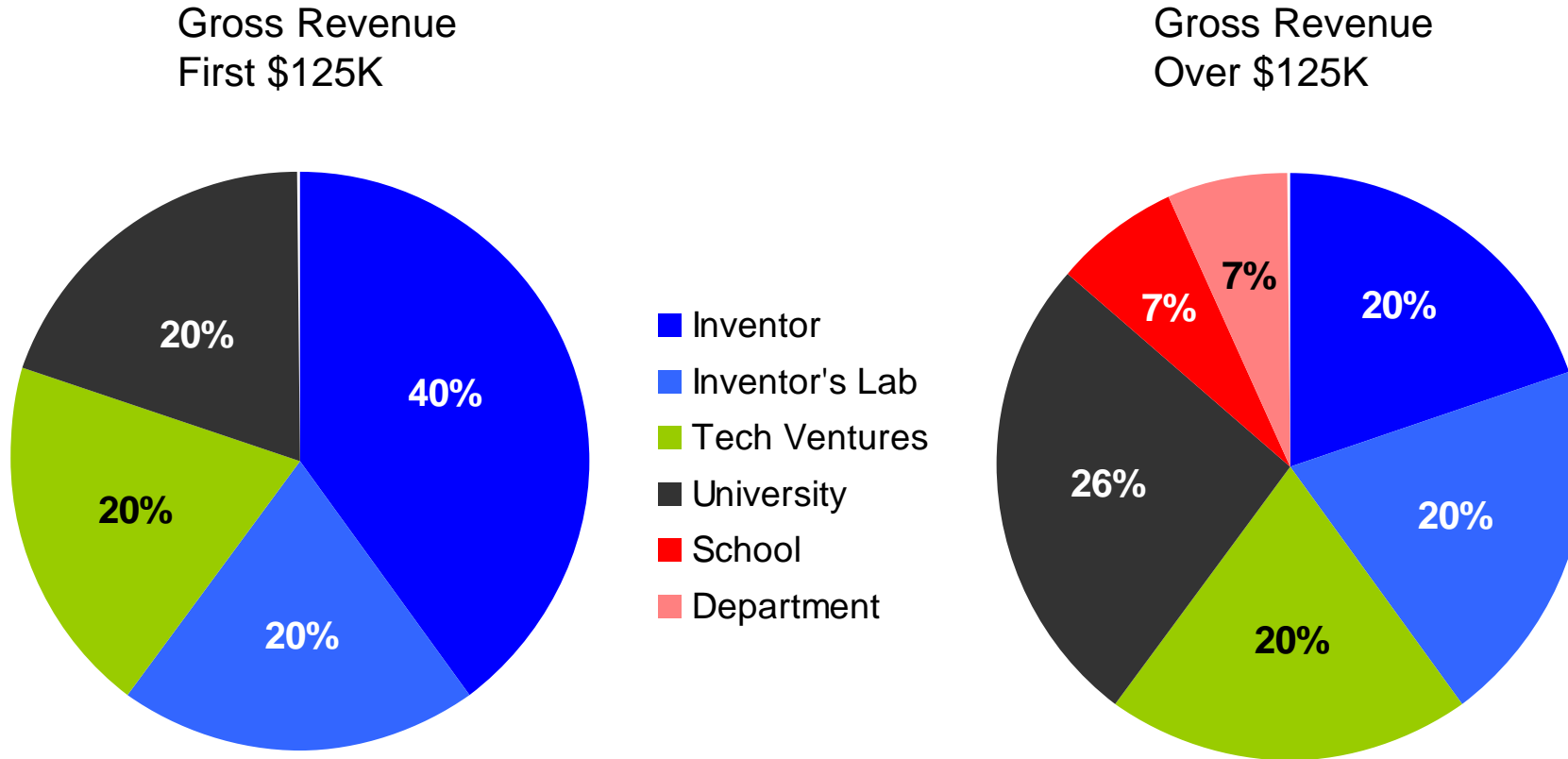
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Thank you

# Where Does the Money Go?

## University Policy On Distribution of Commercialization Revenue

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Note: Certain caps and deductions may apply. See Appendix D of The Faculty Handbook for details.

# Beware the Valley Of Death.



*“Somewhere between invention and commercialization, there’s a desolate place where new technologies go to die alone. It’s called the Valley of Death, and it’s littered with the decaying corpses of technologies that never get to realize their potential. Too many technologies will be left to rot on the lonely, dusty road.”*

# Example of a Recent University Startup: Radiator Labs

Converting Steam Radiators into Smart Energy-Efficient Appliances

**Radiator Labs** 

HOME PRODUCTS ▾ ABOUT ▾

The Cozy, by Radiator Labs, increases comfort, reduces costs and saves energy.

Our patent pending technology installs over your existing radiator turning it in to a high tech, energy efficient heating source.

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# Example of a Recent University Startup: Radiator Labs

***“170 years later, you can now close your window in winter.”***  
**greentechmedia:**

